3 Education and Outreach

Workshops

To communicate the ideas of grid computing to a diverse community of faculty and students, as well as the public at large, GriPhyN and iVDGL have established an active Education and Outreach effort, coordinated at the University of Texas at Brownsville. A workshop was held to publicize the science and technologies to students, teachers and faculty from schools near the University. Students have been involved in testing and making demonstrations using the core software.

Hands-on Experiences

Three minority-serving institutions (MSIs) participate in the creation and operation of iVDGL: The University of Texas at Brownsville (UTB), Hampton University (HU) in Hampton, Virginia, and Salish Kotenai College (SKC) in Pablo, Montana. Each MSI institution can build on its existing research, computing and networking infrastructure, and each has ties to the partners' physics education and outreach activities. Computer science and physical science students at all participating institutions are making hands-on contributions to the creation, operation, and scientific exploitation of the Laboratory.

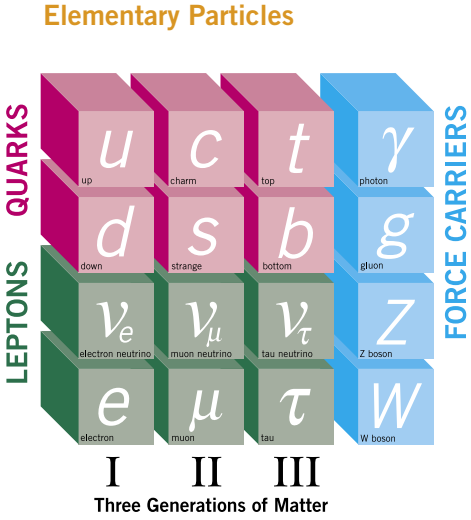
Tutorials

Introductory material describing the principles of computational and data grids, software installation instructions, and tutorials for the basic deployment of the Virtual Data Toolkits (VDT) are maintained on the web site.

The SDSS Skyserver (*http://skyserver.fnal.gov/*) project also has an extensive set of tutorials and educational material. Members of all the Trillium projects are available to give talks and seminars to students and educational institutions.

These programs will be extended next year. We encourage you to contact us by email at *outreach@ivdgl.org*.

Possible Applications of the Grid on the Future of Theoretical Physics?



In the span of the next five years, it is likely that string/M-theory will progress to the point of defining explicitly some parameters of the appropriate six-dimensional Calabi-Yau space, which-along with our four observable dimensions, and an additional dimension used to unify the five string theories together with supergravity into a coherent M-theory framework—describes our eleven-dimensional universe. This does not imply that we will find the correct space, but merely that we may have the appropriate mathematical tools to narrow down our search from the current 10,000 allowable spaces to a much smaller list-the hypothetical size of which obviously cannot yet be determined. I propose that the assignment of the implementation of these mathematical tools should be given to the Grid due to its inherent computing power. With the possibility of the involvement of an enormously large number of parameter spaces, the calculations may indeed require the awesome computing capabilities that the Grid has to offer. Through the task matching service, it can systematically analyze the most appropriate and available computers to be assigned this task. Ideally, each assignment would carry the specific task of testing exactly one Calabi-Yau space for its similarity to our observable universe. I would be more than willing to contribute my own computer's downtime to this fascinating pursuit, the beauty of which rests in the fact that one is not at all burdened by one's contribution. If I woke up in the morning and had to write a paper on my computer, the Grid would simply halt its computational presence, gather what it had already accomplished, and relay this information to the user along with a report of re-assignment to the assessed best available resource for the job-again, courtesy of the task matching service. Taking full advantage of the Grid, the person submitting such a job can cancel it as quickly as (s)he finds an error with his/her technique, and resubmit it when this is remedied. This person need not be alone in this pursuit. Each theorist who should feel so inclined will have the power of the Grid simultaneously at his fingertips, as well, and carry out a similar process with a completely different method or different parameters.

An 18-year-old summer student, now at Stanford University, conceptualized a new grid application which a resident Theorist says is "good physics"